

Zero Retries issue 0166 2024-08-23

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fourth year of publication, with 2000+ subscribers.

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Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - <https://www.zeroretries.org/p/zero-retries-0166>

Request To Send

Paid Subscribers Update

My thanks to **Merik Karman VK1DF / VK2MKZ** for *renewing* as a **Founding Member Annual Subscriber**! (Previously acknowledged in Zero Retires 0161 as “Prefers to Remain Anonymous 39”.)

My thanks to **Rick Prelinger W6XBE** for becoming a *new* **Founding Member Annual Subscriber** to Zero Retires this past week!

My thanks to **Don Coker KM6TRZ** for *renewing* as an **Annual Paid Subscriber** this past week!

My thanks to **Prefers to Remain Anonymous 45** for *upgrading from a free subscription* to an **Annual Paid Subscriber** this past week!

My thanks to **Prefers to Remain Anonymous 46** for becoming a new **Annual Paid Subscriber** this past week!

Financial support from Zero Retires readers is a real vote of confidence for continuing to publish Zero Retires.

ARRL Division Elections - My Endorsements For Northwestern Division

I generally avoid Amateur Radio “politics” in Zero Retires, but my endorsement is based in large part on one of the candidates for Northwestern Division Director being involved in Zero Retires Interesting activity - RATPAC video seminars, and thus it seems appropriate to mention that perspective in Zero Retires.

For the upcoming elections for ARRL Division leadership, I endorse

- **Dan Marler K7REX** for ARRL Northwestern Division Director
- **Michael Sterba KG7HQ** for ARRL Northwestern Division Vice Director

KG7HQ for Vice Director was unopposed, so he’s *in*.

Congratulations Michael! Serve Long, and Prosper! 🙌

I’ve known KG7HQ for decades now and he has served quietly and capably in Northwestern Division leadership since I’ve known him. I’m confident he will serve the members of the ARRL Northwestern Division even better in his new role.

K7REX is the challenger in the upcoming election for Northwestern Division Director and I endorse him because of his leadership in the [RATPAC \(Radio Amateur Training Planning and Activities Committee\) organization](#). RATPAC is an ongoing seminar held online of all things Amateur Radio. One thing that I appreciate about RATPAC is that it actively encourages presentations about technical topics (often Zero Retires Interesting), and it embraces *all* Amateur Radio Operators, regardless of ARRL membership.

In short, I have watched and listened to *many* RATPAC programs, some live, some from its archive, and learned a lot from them. I cannot say the same about any ARRL equivalent programming (if it even exists). Thus I think that the example of RATPAC is a good example of the future of Amateur Radio, rather than the “mostly paywalled” offerings from the ARRL.

It’s my guess / hope that K7REX has received far greater exposure to Amateur Radio as a whole through his leadership and participation in RATPAC. That cannot help but inform K7REX better than the “silo’d” experiences of a typical ARRL Division Director attending mostly ARRL sanctioned events.

If the ARRL is to have a reasonable future in US Amateur Radio, it will have to develop a solution to the existential threat / challenge of ARRL current membership numbers of < 20% (and falling) within US Amateur Radio Operators. I think ARRL and Northwestern Division has a better chance to tackle this issue with K7REX as Northwestern Division Director, than his opponent.

Starlink - Mobile Usage and DNS Issues

Starlink continues to be in the news. I’m seeing so many mentions of Starlink that I lose track of them. One of the more interesting mentions I saw of Starlink is the increasing use of Starlink Mini in vehicles. Apparently the Starlink Mini unit is lightweight enough that people are building (or buying) lightweight frames for it to which they attach suction cups and then attach it to a sunroof on a vehicle and then have in-transit broadband connectivity wherever they go.

One surprising “suction cup” installation I saw was in a private plane that had a sunroof in the rear of the fuselage. The Starlink Mini was suction cupped to the plane’s sunroof and the plane’s owner report that it worked fine as long as his groundspeed didn’t exceed (I forget the number). It occurred to me that this was the very first time such small planes *could* have broadband Internet access while in flight. Cellular isn’t an option for a plane in flight (unless you’re flying pretty low so as not to be heard on too many cell sites simultaneously), nor is GEO satellites, and Iridium isn’t exactly “broadband” connectivity (or inexpensive).

I finally discovered I had a “gripe” about Starlink - the Domain Name Server (DNS) Starlink provides, or direct their users to, is a known issue. I had been having inexplicable, seemingly random errors on my phone and tablet ever since switching over to Starlink from Comcast, or the new Wi-Fi access point in the house. I finally typed in a long description of the issue into a web search, and finally found an answer! A poor DNS experience is a known issue with Starlink and as soon as I put in a manual DNS entry on my phone and tablet, they began working better than I can remember. In the near future I’ll go into my Starlink router and put in manual DNS entries so I don’t have to put manual DNS entries into every individual device on my network. With that issue resolved, now I’m *really* happy with Starlink service for my household!

Ziply Fiber - Not Very “Zippy”

Underground utility survey crews came through our neighborhood more than a month ago on behalf of Ziply Fiber. By now the paint marks are fading on lawns from grass growing out, and the electric utility surveyors left little red flags that are now getting removed for lawn mowing, but still no sign of Ziply Fiber coming anytime soon.

Having seen my interest in possibly getting fiber Internet service from Ziply, my wife Tina called the number on the Ziply Fiber door hanger left on our front door around the same time as the utility surveys crews did their thing. When Tina talked to the Ziply Fiber call center, they sounded puzzled that she was calling and said our neighborhood was not shown as scheduled for fiber deployment.

The call center person said “Thank you for your interest, and when your neighborhood is going to get Ziply Fiber, a crew will come through and leave door hangers on your front door.” Tina said, stunned... “*Ma'am... I'm calling this number because of the door hanger left on my front door*”. They had no further comment.

Help Requested For Wikipedia Editing - “9600 Port”

In this issue, from the article on the new Masters Communications DRA-Pi-Zero, I looked up the article [9600 port](#) on Wikipedia.

It's good that article is there, as a reference, but it really needs some work.

This paragraph:

This port is capable of transmitting and receiving data at speeds of at least 9600 bits per second, but usually faster. This is achieved by bypassing the highpass, lowpass, preemphasis, and deemphasis filters normally contained in the microphone and speaker circuits of an FM transmitter and receiver.[1]

is particularly problematic, but there are other issues that are readily apparent to those of us who are familiar with this subject.

The main issue that needs to be addressed in this article is that the signals in question that are sent through this port / connector are *analog*, not digital.

Other issues that I would love to see addressed:

- The signals are mostly standardized, but not the signal levels (amplitude), which can vary widely between radios and modems.
- The terminology that I've seen that gets the point across about no pre-emphasis or de-emphasis is *flat audio* (which I picked up in reading technical material about repeater audio interfacing), and it would be nice if that could be incorporated into the article as I think “flat audio” helps get the point across about lack of pre-emphasis and de-emphasis.
- It would be nice if the Module 17 could be worked into the list of devices since it requires the use of a radio with a “data jack”.
- Other devices that use this jack now are the new N7EBB Radio Interface Board, the Masters Communications DRA-Pi-Zero, the NW Digital Radio DRAWS, the WB7FHC Nexus DR-X, and *many* Masters Communications audio adapters.
- In current production, the Yaesu FTM-6000R and other Yaesu radios featuring System Fusion provide flat audio, and with the use of an available adapter cable from Yaesu, have this connector.
- Also in current production, the BCM-144, BCM-220, and BCM-440 mobile radios from Bridgecom also provide flat audio, with the use of an adapter from Masters Communications.
- Numerous other radios that have flat audio available, but not this connector, but adapters from Masters Communications and RPC Electronics remedy that situation.

I request that some of you knowledgeable Zero Retries readers do an update of this article. It's a needed and useful reference and it would help Zero Retries Interesting Amateur Radio activity if it was more detailed and more accurate. If someone else can do this, that frees me up to put more time into Zero Retries.

Thanks in advance!

73,

Steve N8GNJ

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New Product from Masters Communications - DRA-Pi-Zero

By Steve Stroh N8GNJ

First, there was Craig Lamparter KM6LYW's [KM6LYW Radio YouTube channel](#):

Welcome back to KM6LYW Radio, the show about Amateur Radio or Ham Radio with an emphasis on digital or data modes, moving information back and forth using Amateur Radio, reimagining Ham Radio in the Information Age.

The KM6LYW Radio YouTube channel is exactly on target as Zero Retries Interesting, and thus it's mentioned at the end of every issue of Zero Retries.

DigiPi Software

Some background on DigiPi... Before considering hardware, the “star of the show” is the [DigiPi software](#) (currently 1.8-3) developed by KM6LYW.

In creating the DigiPi software, KM6LYW did a *stellar* job of creating a critical differentiation of the typical operation of an Amateur Radio station for data communications - he built-in *remote operation for the supported modes in DigiPi*.

Thus you don’t connect a monitor, keyboard, mouse, etc. to a DigiPi station - you connect it to an (Amateur) radio and power supply and then tuck it out of the way. The small display is optional, but I would always want one installed for ease of troubleshooting, such as displaying the unit’s IP address, verifying that it’s up and running (not locked up).

The user interface of your data communications software of choice (APRS, Winlink, FLDigi, and *many* others) is routed over Wi-Fi or Bluetooth to your phone, tablet, laptop, or desktop computer. The typical “operating environment” is working Amateur Radio data modes, silently, from your lap while you’re watching television with someone else.

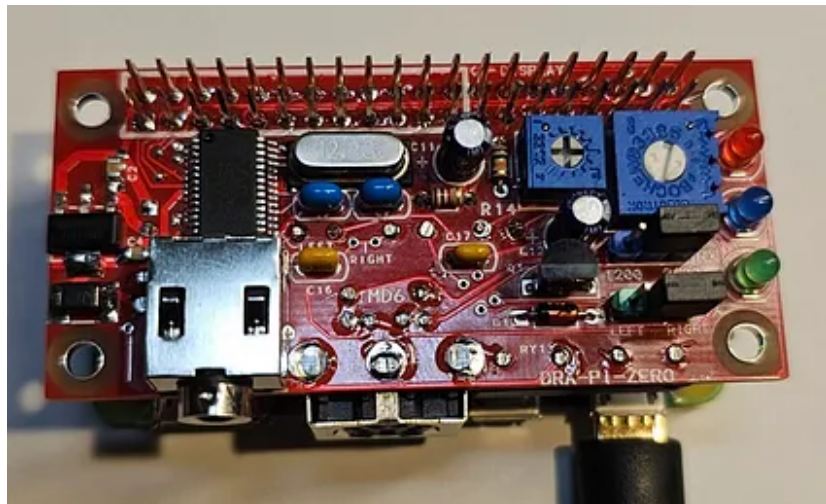
*A frequent point of confusion about DigiPi is that when it uses Wi-Fi or Bluetooth to connect to a tablet, phone, or laptop, those connections are **local, not requiring Internet**.*

This makes a DigiPi system *ideal* for an apartment or condo or dorm or other crowded living arrangement where you can’t devote much dedicated space for a data communications station (with a separate monitor, keyboard, etc.). The radio needs more room and a bit of ventilation than the DigiPi requires.

The New DRA-Pi-Zero

KM6LYW has explained his original DigiPi hardware construction well on his YouTube channel. The original DigiPi required some “bodging” of a transistor and some other components onto a Raspberry Pi Zero and an attached audio interface board called the Fe-Pi. That was functional and inexpensive.

The new Master’s Communications DRA-Pi-Zero is yet another hardware option to build your a DigiPi station.



DRA-Pi-Zero without display - image courtesy of Masters Communications

[Kevin Custer W3KKC of Masters Communications on the DRA-Sound-Cards email list:](#)

New product sneak peek - The DRA-Pi-Zero.

What is it - and why do I need it?

Some of you are aware of a software product called DigiPi. DigiPi is a Linux based program created by Craig KM6LYW that runs on a Raspberry Pi. Craig's explanation is the best, so here it is - “The DigiPi is the ultimate hot-spot for all amateur radio data modes, including APRS, AX.25, Winlink email, ft8, js8cal, SlowScan TV, PSK31, packet and even CW. The implementation is an elegant, inexpensive, low-power, open-source Raspberry-Pi-based amateur radio data transceiver, managed exclusively by web browsers or smart-phone apps, with no bulky keyboards, monitors or complicated wiring.”

I was asked to design a “DRA” [Digital Radio Adapter] radio interface for this project. While there are other radio interface solutions “out there” for this project, some are quite large and power hungry, while others require a good bit of DIY intervention. The DRA-Pi-Zero is an attempt to make it easy to use this software with radios that don't have a built in sound card. It's interesting to note that the DRA-Pi-Zero should work with other software solutions too - not just DigiPi.

The DRA-Pi-Zero is available Assembled and Tested or as a project kit. The project kit is only recommended for very experienced builders. There are surface mount components, and while the Codec and voltage regulator come pre-installed - it's a challenging board to build due to its sheer small size.

As with all other DRA devices, the audio quality is excellent - insuring the widest bandwidth and highest (most reliable) throughput. Connecting the DRA-Pi-Zero to a mobile radio or portable is made as easy as possible using one of two radio connectors - a 3.5mm TRRS and a Mini-DIN-6 female (both are included). The MD6 allows a DRAC-12 or DIN6-Shortie to connect to the vast number of digital ready radios with a matching Mini-DIN-6 data connector. The TRRS is wired to accept cables made by Digirig. The DRA-Pi-Zero has pots to properly range the TX and RX audio levels, and a high-performance reed relay to insure all radio keying (PTT) compatibility.

The DRA-Pi-Zero is designed to be stacked on a Raspberry Pi Zero 2W, as the board is the same size, but - is compatible with most other Raspberry Pi's. It has NOT been tested with the Raspberry Pi5, but the Raspberry Pi Zero, Pi3 and Pi4 all work correctly. Audio frequency response and group / phase delay was tested on 64bit Raspbian OS with a Raspberry Pi4 and Audacity. Its performance equals our other DRA products.

The extended 40 pin header allows an optional 1.3" TFT display to be stacked onto the DRA-Pi-Zero. Screen position alignment is outlined with silkscreen printing. This is truly a tiny but reliable solution that works well for portable or permanent deployments. We've tested them in bicycle races and other events and Craig has one online in active duty. Craig has a forum for DigiPi, so we won't need to duplicate that support here.

More information:

[DRA-Pi-Zero Main Page.](#)

[DRA-Pi-Zero Support Documentation.](#)

[DRA-Pi-Zero Construction Article.](#)

[KM6LYW's DigiPi.](#)

Comments and questions are welcomed.

More details from the [Product Support Documentation - Model DRA-Pi-Zero](#) page:

Overview of DRA-Pi-Zero

Things that may not be otherwise obvious:

- Use with [KM6LYW's DigiPi Software](#) - providing a very high quality but small form factor (Pi Zero) sound card.
- [Here's an installation of a DRA-Pi-Zero in operation.](#)
- Kits come with the surface-mount IC and regulator preinstalled - but other SMT parts do exist and need installed.
- **Kits are only recommended for VERY experienced builders.**
- RX audio feeds the MIC input of the chip, which by default feeds both the Left and Right channels. As such - no channel steering header is included (or needed) for RX audio.
- The larger pot (R12) adjusts the receive audio level.
- The smaller pot (R14) adjusts the transmit audio level.
- The LEFT / RIGHT "TX" header selects which channel feeds the transmitter - no soldering required.
- The TX audio signal is fed from the high-power headphone outputs to the TX header to give the most TX level possible at a low impedance.
- TX audio feeds pin 1 of the MD6 and Ring 1 (the ring closest to the tip) on the TRRS.
- PTT is available at MD6 pin 3 and Ring 2 (the ring closest to the sleeve) on the TRRS.
- The PTT is driven by a transistor with its bias coming from pin 32 of the 40 pin header.
- The Red PTT LED is in parallel with the coil of the PTT relay.
- The Blue Bluetooth LED is from pin 29 of the 40 pin header through a current limiting resistor.
- The Green Carrier Detect LED is driven from pin 36 of the 40 pin header through a current limiting resistor.

The DRA-Pi-Zero *is a pretty cool development*, and kudos to W3KKC for creating it¹! One point of differentiation for the DRA-Pi-Zero versus others (see below) is that it's a product of **Masters Communications**, which has developed [a number of high-performance audio interfaces](#)² for use with higher speed Amateur Radio data communications modes on narrow VHF / UHF channels such as VARA FM³.



DRA-Pi-Zero with display - image courtesy of Masters Communications

In this photo of the DRA-Pi-Zero, there's a hint of another tacit, but important endorsement. NS7C is Scott Currie, who is very active in promoting advanced Amateur Radio data modes on VHF / UHF such as VARA FM, and helping troubleshoot data mode issues on various Amateur Radio email lists relating to data modes. NS7C's involvement in the DRA-Pi-Zero pretty much guarantees that the DRA-Pi-Zero will support advanced data modes on VHF / UHF.

The TX and RX audio level (hardware, not software) audio adjustments (potentiometers) mean set-it-and-*forget-it* audio level adjustments rather than fussing with the internal audio settings within Raspberry Pi OS. Similarly, including a reed relay for Push To Talk (PTT) switching instead of using a transistor insures maximum compatibility. Some audio interfaces use a transistor which doesn't work with every radio.

Update - KM6LYW did a video unboxing and review of the Masters Communications DRA-Pi-Zero:

It's good that Masters Communications has tested and qualified the DRA-Pi-Zero for use on Raspberry Pi units other than the [Raspberry Pi Zero 2 W](#) (the most advanced version of that form factor) because *that* unit is still in very short supply. You can usually find *one* in stock, but you can't buy *more* than one. For my first DRA-Pi-Zero (yep, I ordered one within an hour of learning about it) I wanted to connect it to a Raspberry Pi Zero 2 W as a reference build. Despite its diminutive size⁴, the only vendor that had one in stock as I was looking charged as much for "shipping" as the unit itself (which is, unfortunately, within "wobble room" of Raspberry Pi's authorized maximum pricing of \$15 each for this unit). Thus I'll probably end up installing future DRA-Pi-Zeros on Raspberry Pi 3 or Raspberry Pi 4 units which may well be overkill, but those Raspberry Pi units have ample stock levels now.

Lastly, I had not considered the potential of a DigiPi for use in portable operations. For portable operations, at first glance, the [Digirig Mobile](#) seems a better choice - rugged case, small form factor, etc. But Digirig requires connection to a *computer*, and if you'd like to use a phone or tablet for operating data modes, using a DigiPi has a lot to recommend it given you can tuck it away into a Go Kit and then access it via Bluetooth or Wi-Fi with a tablet, phone, or laptop.

Other Hardware Options for DigiPi

Lastly, for completeness, two other options for DigiPi hardware have emerged this year:

- **Randy Robinson N7EBB** sells a nice kit called the [Radio Interface Board \(RIB\)](#) that makes for a much cleaner installation onto a Raspberry Pi Zero than the original KM6LYW technique. The RIB kit uses all through-hole parts so it's easy to assemble (no surface mount or other fine parts) and solder together. Thus a RIB is an ideal project for an Amateur Radio club group purchase or a group project. It's not stated on the ordering page, but like the KM6LYW technique, the RIB requires the use of an audio interface board (not included), typically the [Fe-Pi available from Budd Churchward WB7FHC](#) who is a collaborator of N7EBB. KM6LYW was impressed enough with the RIB to [showcase it in an episode on his YouTube channel](#).
- **ELEKITSORPARTS** developed their [New digiPi HAT | Ham Radio digi Modes APRS FT8 FT4 Winlink from Raspberry Pi | KM6LYW digiPi Image](#). Unlike the DRA-Pi-Zero, ELEKITSORPARTS offers some optional 3D printed cases.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

[The New M17 Digital Voice Mode is Here!](#)

Link will open in Google Drive - select the August issue

*Jim Moen K6JM writing in the 2024-08 issue of the Mount Diablo Amateur Radio Club's **THE CARRIER** (Page 9):*

The New M17 Digital Voice Mode is Here!

By Jim Moen, K6JM

You may have heard of this new digital voice (DV) mode. MDARC's DV repeater supports it.

The club is proud to offer members and hams within RF range of Mt Diablo various kinds of repeaters, not only on different bands, but supporting different modes of communication, from our popular analog FM 2-meter repeater (147.060 +), to a stand-alone DMR digital voice repeater (144.925 +2.5), to our Amateur TV repeater (1244.5). We also operate an APRS digipeater on 144.39.

And we have a Multimode Digital Voice (DV) repeater (145.0 +2.5). This repeater, starting about 15 years ago, was a D-Star repeater. In

2021, it was upgraded to support several other popular DV modes, including the YSF version of Fusion, DMR, D-Star of course, and, beginning last November, M-17.

Until recently, digital modes available to hams have all used a proprietary compression/decompression (codec) algorithm developed originally for the military but now licensed and sold by a company called DVSI. Many hams have longed for a free, open-source codec, and one is now available. M17 comes from the collaboration of high-end developers around the world. These include experts in hardware, software and infrastructure.

The goal of the "M17 Project" has been to design and implement a total system, starting with firmware for radios, network reflectors (conference servers) and everything in between. Their work is basically done and roll-out has begun.

Our W6CX DV Multimode repeater uses open-source software written by Jonathan Naylor, G4KLX. He flew out to Pacificon in 2018 and again in 2023. He plans to be at Pacificon 2024. When he added support for M17 to his repeater programs, we enabled that new mode on our repeater.

Up until now, the problem has been that there have been no commercially-available M17 radios. For tinkerers, it is possible to make hardware modifications to certain DMR radios and load in a replacement firmware, but many hams will not choose that approach. I built an M17 radio using a \$47 board connected to an analog FM radio. It works, but again, this is not for everyone.

Then this summer, Connect Systems, owned by Jerry Wanger in Los Angeles, began to sell an M17 UHF HT -- the CS7000-M17. It is single band, so will not work with our VHF repeater, but it does work with M17-capable hotspots, and those can then connect in to our repeater via a reflector. Jerry also plans to sell a dual-mode UHF radio that can do both DMR and M17. Those are expected to be available this Fall.

So M17 is beginning to leave the lab and roll out to the real world.

A fast way to play with M17 right now would be to get the Connect Systems M17 HT and an MMDVM hotspot that supports M17. These consist of a Raspberry Pi running the WPSD package and an MMDVM modem that ranges in cost from \$50 to \$125. This would let you link to M17 reflectors and talk to other M17 users around the world.

If some of you like to tinker and experiment, there are also options. If you have a spare analog FM radio with a 9600 baud data port, you could build your own M17 radio for a modest investment in a Module 17 board.

We'll continue to monitor and update you about M17 as it begins to get used more and there are more options.

More information:

M17 Project – www.m17project.org

Connect Systems - www.connectsystems.com

Module 17 board - www.lilygo.cc/products/module17-revision-0-1e

Example hotspot that can do M17: ZUMspot - www.hamradio.com/detail.cfm?pid=H0-017832

(eBay also has some less expensive hotspots, though not all claim to do M17)

WPSD (replacement for Pi-Star) hotspot software for the Raspberry Pi - www.w0chp.radio/wpsd

I predicted that M17 would get much wider notice as a result of the Connect Systems CS7000 M17 and that's being borne out in articles such as this. It's notable that MDARC was ahead of this trend and their W6CX Digital Voice repeater had already been upgraded to support M17 before the [Connect Systems CS7000 M17](#) was released.

I wish there was a similarly progressive Amateur Radio club / repeater association here in Seattle... *or Washington* that was willing to support M17 on a primary repeater such as MDARC has done. But as I said in Zero Retries...

I think the "I just don't get it about M17" contingent in Amateur Radio is just going to have to be routed around by the folks with the energy, the better M17 technology (which will evolve faster and take advantage of new computer and radio technology)... and the youth to outlast the majority.

There are two repeaters in N8GNJ Labs that didn't have a specific purpose (I saw some good deals and snatched them up "for a rainy day"). At least one, or perhaps both units are now destined to be upgraded to support M17.

One of my repeaters is for 222-225 MHz... Hmmm... I might be able to claim to "First M17 on 222-225 MHz".

Report from the International Earth Moon Earth (EME) 2024 Conference



2024 EME Conference

August 9th to 11th, 2024



Image courtesy of 2024 EME Conference

Dave Carlson N2OA via email:

I saw that you were looking for reports from the EME conference.

I attended my first EME conference ever last week at The College of New Jersey and it was a blast. I've never done EME but have had an interest since the early 80's when I saw a presentation by Frank Pollino K2OS on 2m EME.

This conference was done a bit differently than other years and they offered a second track on Friday called EME101, which I attended. This track was for people interested or just starting out in EME. It was unfortunate that by attending the 101 track I missed other interesting presentations on Friday but there was a lot of good information and a lot to learn even for an old VHF+ weak signal guy like myself.

The 101 track had many presentations on getting started, bands, modes, planning, equipment and troubleshooting. The main track had everything from operating stories, to EME history, tracking, building power amplifiers, low noise amplifiers, and dish building and restoration. There was even a presentation on building the communications equipment for the mars helicopter.

The highlight of any of these events is always the people. It was an incredible experience to sit and talk to folks from all over the world that are involved in this great aspect of the hobby, pick their brains, and learn from their adventures.

On a sad note, Al Katz K2UYH became a silent key just before this conference and was a large part of the conference organization. While I never met Al, the stories told by family, friends, and former students were incredible. Amateur radio lost another great person this year but I must commend the team that stepped in to make the conference happen. They did a great job and I'm sure K2UYH was watching with a big smile.

I've now got the bug and hope to be on EME starting with 23cm early next year.

My thanks to N2OA for that great summary of his experience at [International EME Conference 2024](#).

To date, I haven't found any reference to the International EME Conference 2024 being video recorded, though I did find recordings of the [19th \(2022?\) International EME Conference](#), so there's reason to hope that there will also be video recordings of the 2024 conference.

After reading N2OA's report I checked the website and I was very pleasantly surprised that the conference did a *great* job of putting all the presentation materials online on the [Downloads](#) tab of the website:

- Conference Papers
- EME101 Presentation
- Conference Power Points (nearly 3 GB, even in .zip format!)
- Presenters Bios
- [23cm Band – G4SIH](#)

That last item is a *current* update on the situation of Amateur Radio's situation as a secondary user of the 23cm band (1240 - 1300 MHz) and the increasing use of that band by its *primary* user, Global Navigation Satellite Systems (GNSS). The US Global Positioning System (GPS) was, for a long time, the only, and then primary GNSS system (which does not use the 23cm band), but other GNSS systems are now online, especially the European Union (EU) / European Space Agency (ESA) [Galileo GNSS system](#), and they don't want Amateur Radio interference of those systems.

I was also impressed that the conference had these sponsors:

- IEEE Princeton / Central New Jersey Section
- The College of New Jersey School of Engineering
- IEEE The College of New Jersey, IEEE Student Chapter
- Delaware Valley Radio Association
- PACK RATS

- ARRL

The association of this conference with IEEE and the College of New Jersey are encouraging! We in Amateur Radio ought to be actively cultivating more such “cross fertilization” between technical societies, education, and “Zero Retries Interesting” Amateur Radio activities such as EME.

And lastly, I have been corresponding with a Zero Retries reader and in part debating the merits of in-person Amateur Radio technical conferences versus virtual technical conferences. Thus I was impressed that there were [over 100 attendees](#) (I stopped counting after I hit 100), and I mentioned this to my correspondent.

As N2OA noted in his report:

The highlight of any of these events is always the people. It was an incredible experience to sit and talk to folks from all over the world that are involved in this great aspect of the hobby, pick their brains, and learn from their adventures.

Indeed - that has also been *my* experience with Amateur Radio technical conferences that I've attended over the years. If you cannot attend in person, attending virtually, and watching recordings, gives you *some* of the *information*. But, in my opinion, the *real value* of attending a technical conference in person is the serendipitous interactions one-on-one with attendees and presenters and vendors. It's one of those “trying to drink from a firehose” experiences. I may well not have felt that I'm equipped to tackle a project like creating Zero Retries if not for the formative experiences I've had at Amateur Radio technical conferences such as the Digital Communications Conferences over the years. I learned so much, so deeply, so quickly at those conferences, and Zero Retries is part of paying it forward to future generations of Amateur Radio Operators.

[Hacking the \[Quansheng\] UV-K6 \[Portable Radio\] for Digital Modes](#)

Robb Riggs WX9O on the m17-users email list:

Working on this...

See <http://www.mobilinkd.com/2024/06/25/hacking-the-uv-k6-for-digital-modes/>

It will require hacking the radio hardware, the firmware, and adding on an M17 baseband processor.

Currently working on how to cleanly bypass the audio amp as I think it is causing some of the distortion I am seeing.

The referenced blog post:



Modified UV-K6 connected to Mobilinkd TNC4 configured for 9600 baud - Image courtesy of Mobilinkd

There is an active community of radio amateurs dedicated to hacking the Quansheng UV-K5 and variants. I count myself as one of them. In the linked article I show how to modify the hardware and firmware of the radio to allow it to be used for digital modes such as 9600 baud FSK and 4-FSK modes such as those used by the M17 Project.

<https://github.com/mobilinkd/uv-k6-digital-mod/blob/master/UV-K6.ipynb>

That GitHub page (this is becoming a merry chase...)

One of the holy grails of amateur radio is an inexpensive FM transceiver with a flat response. An old-school ham would call this a radio with *discriminator output and varactor input* but everything is digital and I/Q modulated these days, so a *flat response* is a clearer way to say what we are after. These are radios that are capable of digital modes like 9600 baud GFSK or 4-FSK. Radios such as these are typically expensive mobile units or base stations with packet data ports. These typically cost many hundreds of dollars. To date, only Kenwood has made a handheld radio (long since discontinued) which exposed this capability directly.

The Quansheng UV-K5 and variants (including the UV-K6) have an active hacking community. The hardware has been well-documented and the firmware reverse-engineered. Customized firmware variants are in wide use. The BK4819 RF IC used in this device is fairly well documented.

I have discovered that with a few trivial hardware modification and some new firmware features, we can enhance these \$30 radios to provide a flat response on both transmit and receive, allowing these radios to be used for digital modulation. This article documents those changes and how to get started with digital modes using this radio, along with a modem such as the Mobilinkd TNC4.

[A later post on m17-users by WX90:](#)

I am trying to work through an issue with the radio. RX shows some odd artifacts where the DC bias jumps significantly as soon as a signal is present. (Likely not an audio amp problem as I originally thought.) This happens when the radio has been in RX mode for a while. The issue seems to occur in both Wide and Narrow mode, but to a lesser extent in narrow mode. The image below shows the issue. The polarity of the drift and then sudden adjustment after ~120ms can switch (can drift up or down), and it can be much more severe. The image below is in wide mode. In narrow mode, it is less noticeable, but still enough to cause the first few frames to get corrupted. This is not much of an issue with M17 voice, since we can recover after a few frames. That's not possible with packet mode. All of the frames must be received correctly.



TX or changing the RX frequency resets it and it works well for a bit, then starts to show the behavior again. So there is likely a way to fix this or work around the issue. We just don't have good docs for the chip. If anyone wants to explore this issue, I'd be happy to point out where to start poking at the firmware. The hardware mod is pretty easy if you can do surface mount work. And the firmware is easy to modify, build and load.

[Vladimir Zivadinovic YU4TET replied](#) (beating me to making the same comment):

The Quansheng mod is some of the most exciting work in ham radio. It can become the easiest and cheapest way for a ham to dip their toes in modes requiring flat audio.

There was only 1 (one) HT radio with flat audio for digital modes before, the TH-F6A/TH-F7E. It is expensive and unobtainium.

This would make portable work with digital modes more accessible and much, much cheaper than anything else. Currently, you'd be stuck with digital modes to one of the Yaesu mobiles, or a commercial mobile rig. This is not cheap, nor easy, nor practical.

I wish you the best of luck with your Quansheng modding!

One issue with using portable radios for data is the Receive / Transmit time tends to be longer than desired for data communications, and WX90 addresses that in the Future Work section:

Turn-around time can be improved by changing the firmware to configure the transmitter and receiver only when material changes are made. Currently, the firmware reconfigures many BK4819 parameters when switching between transmit and receive. Some of this is likely done to make dual-receive simpler to implement.

The transmit delay is the time between pressing PTT and the time the transmitter is active and at full power. It is currently about 120ms. This is longer than required. The firmware does key debounce which requires 30ms. This can be eliminated for PTT in `DIG` mode where PTT is controlled by a modem/TNC. The same improvements for turn-around time will also reduce transmit delay. I suspect it is possible to get each down to around 40ms without too much work.

Kudos to WX90 for tackling this! His GitHub article does a great job in explaining the hardware and firmware modifications, and his current progress and future work.

As YU4TET said, this mod to a \$30 portable radio would make (faster) [data] modes more accessible for experimenters. A UV-K6 modified for flat audio and faster RX/TX turnaround would make a *great* radio for a DigiPi system that's operating higher-speed data modes. Or, heck... at a mere \$30 each, just buy two - one for TX and one for RX - full duplex (probably operating dual band). If Quansheng began offering a "data" version of this radio, factory modified per WX90's recommendations, I'd happily pay double the \$30 price for such a unit. I've done SMT work, even as small as 0402 components, and while it's doable with a sturdy bench, good light, a swing arm stereo microscope, steady hands, and a temp-controlled soldering iron with SMT tip... *it... is... tedious... work.*

[freebeacon / FreeDV Beacon With Repeat](#)

Alan Veard VK2ZIW on GitHub:

Automated Beacon for FreeDV that runs on a Raspberry Pi

- FreeDV beacon With repeat:
- Listens for FreeDV signals, then transmits a reply.

- Supports FreeDV 700D and 700E modes.
- Places the received signals as files.
- Requires a Linux machine with a sound card and RS232-PTT (or Hamlib CAT) interface to your radio.
- Just one sound card is required.
- Can run on machines as small as a Raspberry Pi.
- Now running with Codec2 API Ver 1.2
- Using Reliable Text, but we need extra chars for trigger string eg. + and -
- Since FreeDV cannot add these to a callsign, now triggering with numbers at the end of your callsign eg. VK2FABC0 or for short callsigns K1AA000
- With ideas like this, it's like having Talk Groups

Stuff like this is so cool...

My thanks to Cale Mooth K4HCK for mentioning this in an email, who noted:

It's an interesting use case that could facilitate the request of "on-demand" information via HF and FreeDV.

This makes me think that freebeacon could be used as a simple ping, or perhaps even a slightly more interesting system like the old NOS / UNIX "finger" utility. When I read this:

It requires a "txfilename" wave file to transmit, e.g. some one saying "Hi, I am a FreeDV beacon blah blah". The signal report is encoded into the transmit text message. Make the wave file long enough so that the the signal report is repeated a few times, say 30 seconds. Transmit will stop when the "txfilename" wave file is played once.

... my slightly mischievous mind thought of putting an AI system to work creating funny audio IDs with my callsign using imitations of memorable voices such as Gilbert Gottfried (recently deceased) or Mel Blanc (voice of Bugs Bunny and many other memorable characters).

TAPR Board of Directors Call For Nominations 2024

Stanq Horzepa WA1LOU on several TAPR-sponsored email lists:

Three Director positions on the TAPR Board of Directors are now open for nomination and nominations may be submitted now.

TAPR Board members serve three-year terms and their responsibilities include:

1. Attendance at both in-person board meetings each year. [One is held at the Hamvention in May, the other at the Digital Communications Conference (DCC) in September.]
2. Regular participation in the continuous board session, which is conducted over the Internet.
3. Active engagement in TAPR's management.

To place a person in nomination, please remember that he or she must be a member of TAPR. Also, confirm that the individual is willing to have his or her name placed in nomination. By September 21, 2024, send that person's name (or your own if you wish to nominate yourself), call sign, mailing address, e-mail address, phone number(s), and a biographical sketch (250 words maximum) via contact@tapr.org or via snail mail to TAPR, 1 Glen Ave., Wolcott, CT 06716-1442

The three current [TAPR Directors](#) whose terms are expiring in 2024 are:

- Dan Babcock [N4XWE](#)
- George Byrkit [K9TRV](#)
- Scotty Cowling [WA2DFI](#) (current TAPR President)

[Mobilinkd TNC4 firmware version 2.5.14](#)

Rob Riggs WX9O on the Mobilinkd email list:

TNC4 firmware version 2.5.14 has been released and the User Guide has been updated. The TNC will indicate when its audio input is being overdriven. PTT lockup on iOS when 2 or more apps are attached to the TNC is fixed. The 9600 baud modulator and M17 demodulator have been improved.

The [change log for this version](#) shows 14 distinct updates, including these Zero Retries Interesting updates:

- Update 9600 baud FSK modulator to use interpolating FIR filter rather than lookup table for pulse shaping.
- Fix M17 packet SRC (TNC3 -> TNC4).
- Fix M17 demod offset.

- Fix divide by zero that would cause M17 demodulator to stop working.
- Other miscellaneous M17 demod changes which should improve demod performance.

Kudos to WX9O for putting that level of effort into M17 which I'll guess is still a tiny percentage of use cases for purchasing a TNC4... but *growing*!

The Beginners Guide To The Radioberry HF SDR Transceiver Pi Hat - YouTube

As *always*, Matt Miller M0DQW does a *great job* explaining a Zero Retries Interesting subject on video. I love that he provides a *complete* description of the subject in his video titles, and unlike so many other Amateur Radio YouTube content creators, does not pad his videos with extraneous commentary.

If you're a regular reader of Zero Retries, but not following the [Tech Minds YouTube channel](#), you're missing a *lot* of great Zero Retries Interesting content.

AREDN Plans to Sunset Global Tunnel Server in "Near Future"

Orv Beach W6BI on several AREDN email lists:

Years ago it was really difficult to get tunnels set up, so the AREDN team set up a "global" tunnel server to provide connectivity and many hams took advantage of it.

Since then tunnel became easier to set up and then supernode clusters came into being. Now there are only a few nodes still connected to the global tunnel server. Since there are so few, and the code on the tunnel server is way out of date and problematic, AREDN will pull the plug on it in the near future. Here's the list of nodes still connected to it. If you own or know the owner of one of these nodes, make plans for an alternative link into the network (if you don't have one already).

- AJ6GZ-X86-GLOBAL
- KB4YFK-GL150
- KC6JPG-AREDN CLOUD-01
- W7ACS-SEATTLEEOC
- K4SPB-HAP-1
- KM6IAU-ONAGA-NODE0
- K5DLQ-HAP-1
- W1HS-UTIK-5AC2ND-1
- AE7WY-CLKWY-RTR-MAIN

W6BI is a Zero Retries Pseudostaffer, AREDN Project Manager, and AREDN Ambassador.

Coming Soon! 12th Annual International DATV QSO Party

From [Amateur Television Journal, August, 2024, 2nd edition, Issue #168](#); Jim Andrews KH6HTV, Editor:

The Melbourne Amateur Television Group along with the Boulder Amateur Television Club, Amateur Television in Central Ohio, and the

Amateur Television Network is preparing our worldwide “stage” for the upcoming DATV QSO Party 2024! The DATV QSO Party is an annual event utilizing the mode of amateur television within the amateur radio spectrum. This grand event on video begins on Saturday, August 31, 2024, beginning at 00:00 UTC (*Friday, August 30, 2024 beginning at 5:00pm Pacific Daylight Time / 8:00pm Eastern Daylight time in the USA*). The DATV QSO Party links up with participating ATV repeater systems and chapter stations throughout the world during the approximately 11 hour event, but could go longer depending on the number of check-ins received. This event is the ultimate amateur television “Net.” Hams and the general public will be able to watch our live-stream on YouTube, Facebook, BATC, and through the AREDN system.

...

Participating repeater systems and uplink system for this year’s “party” so far includes but not limited to:

- VK3RTV – Melbourne, Australia
- WR8ATV – Columbus, Ohio, USA
- W0BTv – Boulder, Colorado, USA
- W6CX – Northern California, USA
- W6ATN – Southern California, USA (6 ATV repeater systems linked) W7ATN – Arizona, USA
- WB9KMO – Mesa, AZ USA
- QO-100 OSCAR Satellite

...

If you are a licensed ham radio operator and don’t have an ATV station , you can still join in on the fun and festivities of the DATV QSO Party. You can participate with us on our ATN IP video insertion channel on our Whereby system at: <https://whereby.com/atn-tv> and you can check-in and participate with our chapter stations and be included into the “party.”

Mark your calendar and come join us for the biggest amateur television party on the planet for the 12th Annual DATV QSO Party on Saturday, August 31, 2024 beginning at 00:00 UTC. It will be the video party of the year!

How to Watch: You can watch the “party” through our streaming channels:

YouTube:

- <https://www.youtube.com/AmateurTelevisionNetwork>
- <https://www.youtube.com/@IanVK3QL>

Facebook:

- www.facebook.com/AmateurTelevisionNetwork

BATC:

- <https://batc.org.uk/live/w6atn>

This is Zero Retries Interesting that it’s a rare “linked via Internet” event to showcase Digital Amateur [Radio] Television (DATV) technology and operations, not just to other ATV operators, but Amateur Radio Operators not (yet) using ATV, and the general public that can watch online per the above links. Outside of this event, these local / regional Amateur Television networks operate almost entirely via radio.

See Amateur Television Network’s [DATV QSO Party page](#) for archives of past events.

EggNOGS (Eggbeater) Antenna Kits Now Available for Five Bands

Mark Smith (Smitty) N6MTS on the [Halibut Electronics email list](#):

All 5 bands are now available for purchase:

- 137.5 MHz for Weather Satellites
- 145.9 MHz and 436.5 MHz for Ham Bands
- 388.0 Mhz and 401.0 MHz for Commercial Bands

[EggNOGS Antenna page](#) - Note that these are actually semi-kits; you’ll be supplying some of the components such as a PVC mast and the copper (or other) wire for the actual antennas. But the very hard part, the phasing circuitry necessary for the antenna’s polarization to be “up” (suitable for satellite reception and transmission) is done in a pair of circuit boards supplied in the semi-kit.

I view eggbeater antennas as the ideal satellite antenna for beginning satellite users. The radiation pattern of a conventional omnidirectional (ground plane) antenna is horizontal. Yagi (beam) antennas have a sufficiently tight radiation pattern that they must be aimed at the satellite. That’s fun for a casual contact, but to regularly work satellites with a yagi requires azimuth / elevation rotors. An eggbeater antenna’s radiation pattern is “omnidirectional *up*” - not as good for working satellites as an aimed yagi, but far better than a ground plane. Building up the 145.9 MHz and 436.5 MHz EggNOGS antennas will be a good winter project.

Now that EggNOGS is in production and stocked, N6MTS will be working on two follow-on projects - [AmpNOGS](#) and [TeaNOGS](#).

EggNOGS is just the antenna. No active electronics at all.

AmpNOGS is a transmit capable LNA.

TeaNOGS is a bias-T injector with features.

AmpNOGS is an LNA designed to attach directly to EggNOGS, and be powered by bias voltage on the coax. If you have a radio that can generate a bias voltage (eg: RTL-SDR dongle, or the Icom 9700), then AmpNOGS will work directly with that.

If your radio can't put a bias voltage on, you'll need a bias-T in the shack. For receive, any old bias-T will do. AmpNOGS supports between 4v and 15v.

BUT!

If you want to transmit through AmpNOGS, you need a system that will remove the bias voltage before you transmit. The IC-9700 can be configured for this directly. (The RTL-SDR dongle can't, but it's Rx only, so it's irrelevant.)

If you want to transmit, and your radio cannot remove bias on transmit, then TeaNOGS is for you. Like all bias-T's, it injects bias voltage on the coax. It also has a PTT input; when PTT is triggered, it remove bias voltage from the line to put AmpNOGS in Tx mode.

It requires a PTT signal (either active high or active low) from your transmitter, which many radios can provide. It might be on the "data" or "accessory" port. My Flex has an RCA with it directly.

I don't have firm numbers on power handling for EggNOGS and AmpNOGS yet. I've tested EggNOGS up to 17W and it got toasty after a couple minutes of constant carrier FM, but not over-toasty. Highest I saw was 40C, but all components are rated to 85C or more. I haven't measured AmpNOGS yet (though I expect it'll be easier/better than EggNOGS.)

While none of these units - EggNOGS, AmpNOGS, and TeaNOGS breaks new ground technologically, N6MTS' innovative use of carefully-designed *circuit boards* to create the necessary (very fussy, exacting) phasing circuitry makes an EggNOGS antenna much less expensive and thus more approachable. Thus that makes satellite *operation* much less expensive and more approachable for greater numbers of radio experimenters, including those that want to provide telemetry downloads from experimental satellites into the [SatNOGS network](#) - no Amateur Radio license required!

AREDN Software's New UI - An Overview (Video)

My thanks to friend Ren Roderick K7JB for pointing out this video.

APRS Messaging Being Covered by Jason Oleham KM4ACK (Videos)

On his email list (for which I cannot find an online reference to link to) KM4ACK reports a followup to the above video:

Experimental Success! BEHIND THE SCENES

Before the Huntsville Hamfest I had an idea that utilized APRS messages to set up a quasi social media network. By creating a group, we could send messages from both the RF world and the Internet. Full details can be found in [this video](#).

How did it work? Better than I expected but there were short comings. [Messages](#) that weren't entered over RF and those that were from RF but out of digipeat range never made it to my radio. This meant that without an internet connection, options to read the messages were limited. So was this a fail? I don't think of it as a fail but more of a learning opportunity to better understand how group messages work. Assuming everyone is in range of the same digipeater, group messages are an excellent RF only tool and a fantastic way to deliver a message to multiple people. One example is the message below that my radio received on Saturday morning before the show.



Image courtesy of Jasen Oleham KM4ACK

N4GLE used the APRS group "QST" to pass an important message to everyone in range of the digipeater. Since most APRS radios come preprogrammed with the QST group, he was able to send it to multiple operators without knowing their individual call signs. Real time data delivered over RF is what makes APRS much more than "vehicle tracking" but it takes operators with the understanding and skill set to pull it off. Once understood and implemented correctly, APRS becomes a very valuable tool in our arsenal.

In my (admittedly limited) experience, APRS messaging is an under-appreciated capability in Amateur Radio. While APRS messaging has been a capability of APRS from nearly the beginning, it's never been easy to use. If it had been, perhaps Amateur Radio would have a compelling "peer" mode to Meshtastic which is getting a lot of attention.

I think the new paradigm of decoupling the radio / modem / TNC from the keyboard / display, and moving the latter to a smartphone or tablet such as the excellent [RadioMail](#) and [Meshtastic](#) apps would make APRS messaging far more usable and popular. The videos above show that APRS messaging is sometimes built-in to a radio... but it's far from easy / friendly / convenient / "discoverably" easy to use. But as soon as you see RadioMail or Meshtastic, you quickly grasp how easy it is to use.

There is also an [aprs.fi app](#) which includes APRS messaging as a feature (when subscription is enabled), but I have not investigated that app. Not having seen how the aprs.fi app implements APRS messaging... I'll guess that I'd still have a preference for a dedicated *messaging* app such as RadioMail or Meshtastic. When I'm composing a message, I'd rather have the entire device devoted to a display and keyboard with nothing else infringing on the small screen real estate that is available.

Note that the use of a smartphone or tablet does not imply "Internet" is needed to use these apps - they are communicating via Bluetooth or Wi-Fi back to a radio / modem / TNC stack, and not using Internet for the actual communications in the app.

If Amateur Radio were to create a good combination of the following for using APRS messaging:

- Portable radio / battery
- Modem / TNC
- Bluetooth / Wi-Fi link
- Display / Keyboard / utilities / configuration app on a smartphone

I think that combination would be a powerful “answer” to Meshtastic in Amateur Radio.

Perhaps this might be an interesting use case for Computer and Telemetry System (CATS) - [cats.radio](#) and its newer radio technology of Frequency Shift Keying (FSK) at 9600 bps on UHF... if a compatible app for a smartphone could be developed.

Raspberry Pi 5 For Radio Amateurs With The RTL-SDR V4 (Video)

If you have an interest in using the Raspberry Pi 5 with Ham Radio, but don't know where to start, then check out this new book from Elektor. We go through the book and even perform some of the projects which are highly detailed within the book.

I wasn't previously aware of the book [Raspberry Pi 5 for Radio Amateurs](#), but by now it's totally unsurprising that Matt Miller M0DQW of the Tech Minds YouTube channel is on it.

It's matter-of-fact, approachable material like this that, in 2024 and beyond, is presenting Amateur Radio in a manner that is *relevant and interesting* to newer, younger, techier, hacker-oriented Amateur Radio Operators. It's encouraging that Elektor (magazine) chose to partner with RTL-SDR Blog for the bundled Software Defined Receiver. In my observation, RTL-SDR Blog makes the best, most reliable of the small form factor “SD RX dongles” and thus buyers of this book and receiver combination will have a good chance of a satisfying experience working through the various experiences outlined in the 303 pages of this book.

[A Free and Open Source IPv6 Textbook](#)

A collaborative IPv6 book. This project is a practical introduction to IPv6 for technical people, kept up to date by active practitioners. The book will be available free of charge (and free of advertising) on-line, possibly with an option to obtain a printed copy at cost price.

The more I have read about IPv6... the less I like the “mess” that IPv4 has become, with the necessity with IPv4 for many workarounds such as Network Address Translation (NAT). Once you understand its advanced capabilities, IPv6 just works, and I think IPv6 is just going to be a better solution for Amateur Radio systems now, and certainly in the decades to come. That said, there will always be a place for IPv4 in Amateur Radio as many of our “trailing edge” applications and hardware just have no way of handling IPv6.

Leave a comment

Share

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- **Annual Founding Members who generously support Zero Retries financially:**
Founding Member 0000 - Steven Davidson K3FZT (Renewed 2024)

Founding Member 0002 - Chris Osburn KD7DVD (Renewed 2024)
Founding Member 0003 - Don Rotolo N2IRZ (Renewed 2024)
Founding Member 0004 - William Arcand W1WRA (Renewed 2024)
Founding Member 0006 - Todd Willey KQ4FID
Founding Member 0007 - Merik Karman VK1DF / VK2MKZ (Renewed 2024)
Founding Member 0008 - Prefers to Remain Anonymous 14
Founding Member 0009 - Prefers to Remain Anonymous 19
Founding Member 0011 - Rick Prelinger W6XBE
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your [QRZ](#) page (or other web presence) and include a link:

<https://www.zeroretires.org>
- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- [Dan Romanchik KB6NU](#) mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Jeff Davis KE9V](#) also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Amateur Radio Weekly](#) by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories that often feature "Zero Retires Interesting" topics.
- [Experimental Radio News](#) by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- [RTL-SDR Blog](#) - *Excellent* coverage of Software Defined Radio units.
- [TAPR Packet Status Register](#) has been published continuously since 1982.
- [Hot Iron - The Journal of the Constructor's Club](#) is a delightful quarterly newsletter.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- [HB9BLA Wireless](#) by Andreas Spiess HB9BLA
- [KM6LYW Radio](#) by Craig Lamparter KM6LYW (home of the [DigiPi project](#))
- [Modern Ham](#) by Billy Penley KN4MKB
- [Tech Minds](#) by Matthew Miller M0DQW

These podcasts regularly feature Zero Retries Interesting content:

- [Ham Radio Workbench](#) by George Zafiropoulos KJ6VU (and friends)
- [Foundations of Amateur Radio](#) by Onno Benschop VK6FLAB

Zero Retries is currently using the [Substack email publishing platform](#) to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join **2000+** other subscribers:

Subscribe now

Please tell your co-conspirators about Zero Retries — just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

[Zero Retries / N8GNJ on Mastodon](#)

Zero Retries (N8GNJ) is also on Bluesky — [@n8gnj](#) — just click:

[Zero Retries / N8GNJ on Bluesky](#)

Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- [Store and Forward Podcast](#) - a podcast about the past and future of amateur radio, by Kay Savetz K6KJN (curator of the [Digital Library of Amateur Radio and Communications](#)) and Steve Stroh N8GNJ (Editor of the Zero Retries newsletter.)
- [SuperPacket blog](#) — *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs in Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

2024-08-23

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Footnotes for this Issue

[1](#)

There was a subtle but important endorsement implied in the [fourth photo](#) of the unit - the callsign [NS7C - Scott Currie](#) who is one of the most knowledgeable subject matter experts on data communications on Amateur Radio VHF / UHF channels. A quick email exchange with NS7C confirmed that he was involved in the DRA-Pi-Zero.

[2](#)

Formerly known as “sound cards”, though such units haven't been actual *cards* (as in expansion cards for PCs for *decades* now... but the terminology persists.

[3](#)

Not generally viable for this unit without a lot of work to run Windows software on a Raspberry Pi on top of Linux (such as using WINE). This is stated as an example of the depth of experience from Masters Communications.

[4](#)

The Raspberry Pi Zero (and successors) are *so small and light* that when the Raspberry Pi Zero debuted, Raspberry Pi Foundation's magazine The MagPi

Issue 40 [included an *actual* Raspberry Pi Zero](#) on the cover of that issue! Thus \$15 for “shipping” of a Raspberry Pi Zero unit seems excessive.